

(vii) For a DOT exemption cylinder, permanent expansion exceeds the limit in the applicable exemption, or the cylinder meets another criterion for condemnation in the applicable exemption.

(viii) For an aluminum or an aluminum-lined composite exemption cylinder, the cylinder is known to have been or shows evidence of having been over-heated.

(2) When a cylinder must be condemned, the requalifier must stamp a series of X's over the DOT specification number and the marked pressure or stamp "CONDEMNED" on the shoulder, top head, or neck using a steel stamp. Alternatively, at the direction of the owner, the requalifier may render the cylinder incapable of holding pressure. In addition, the requalifier must notify the cylinder owner, in writing, that the cylinder is con-

demned and may not be filled with hazardous material and offered for transportation in commerce where use of a specification packaging is required.

(3) No person may remove or obliterate the "CONDEMNED" marking.

[67 FR 51660, Aug. 8, 2002, as amended at 68 FR 24662, May 8, 2003]

§ 180.207 [Reserved]

§ 180.209 Requirements for requalification of specification cylinders.

(a) *Periodic qualification of cylinders.*

(1) Each specification cylinder that becomes due for periodic requalification, as specified in the following table, must be requalified and marked in conformance with the requirements of this subpart. Requalification records must be maintained in accordance with § 180.215. Table 1 follows:

TABLE 1—REQUALIFICATION OF CYLINDERS ¹

Specification under which cylinder was made	Minimum test pressure (psig) ²	Requalification period (years)
DOT 3	3000 psig	5
DOT 3A, 3AA	5/3 times service pressure, except non-corrosive service (see § 180.209(g)).	5, 10, or 12 (see § 180.209(b), (f), (h), and (j))
DOT 3AL	5/3 times service pressure	5 or 12 (see § 180.209(j))
DOT 3AX, 3AAX	5/3 times service pressure	5
3B, 3BN	2 times service pressure (see § 180.209(g)).	5 or 10 (see § 180.209(f))
3E	Test not required.	
3HT	5/3 times service pressure	3 (see §§ 180.209(k) and 180.213(c))
3T	5/3 times service pressure	5
4AA480	2 times service pressure (see § 180.209(g)).	5 or 10 (see § 180.209(h))
4B, 4BA, 4BW, 4B–240ET	2 times service pressure, except non-corrosive service (see § 180.209(g)).	5, 10, or 12 (see § 180.209(e), (f), and (j))
4D, 4DA, 4DS	2 times service	5
DOT 4E	2 times service pressure, except non-corrosive (see § 180.209(g)).	5
4L	Test not required.	
8, 8AL		10 or 20 (see § 180.209(i))
Exemption cylinder	See current exemption	See current exemption
Foreign cylinder (see § 173.301(j) of this subchapter for restrictions on use).	As marked on cylinder, but not less than 5/3 of any service or working pressure marking.	5 (see §§ 180.209(l) and 180.213(d)(2))

¹ Any cylinder not exceeding 2 inches outside diameter and less than 2 feet in length is exempted from volumetric expansion test.

² For cylinders not marked with a service pressure, see § 173.301a(b) of this subchapter.

(b) *DOT 3A or 3AA cylinders.* (1) A cylinder conforming to specification DOT 3A or 3AA with a water capacity of 56.7 kg (125 lb) or less that is removed from any cluster, bank, group, rack, or vehicle each time it is filled, may be requalified every ten years instead of every five years, provided the cylinder

conforms to all of the following conditions:

(i) The cylinder was manufactured after December 31, 1945.

(ii) The cylinder is used exclusively for air; argon; cyclopropane; ethylene; helium; hydrogen; krypton; neon; nitrogen; nitrous oxide; oxygen; sulfur

hexafluoride; xenon; chlorinated hydrocarbons, fluorinated hydrocarbons, liquefied hydrocarbons, and mixtures thereof that are commercially free from corroding components; permitted mixtures of these gases (see § 173.301(d) of this subchapter); and permitted mixtures of these gases with up to 30 percent by volume of carbon dioxide, provided the gas has a dew point at or below minus (52 °F) at 1 atmosphere.

(iii) Before each refill, the cylinder is removed from any cluster, bank, group, rack or vehicle and passes the hammer test specified in CGA Pamphlet C-6 (incorporated by reference; see § 171.7 of this subchapter).

(iv) The cylinder is dried immediately after hydrostatic testing to remove all traces of water.

(v) The cylinder is not used for underwater breathing.

(vi) Each cylinder is stamped with a five-pointed star at least one-fourth of an inch high immediately following the test date.

(2) If, since the last required requalification, a cylinder has not been used exclusively for the gases specifically identified in paragraph (b)(1)(ii) of this section, but currently conforms with all other provisions of paragraph (b)(1) of this section, it may be requalified every 10 years instead of every five years, provided it is first requalified and examined as prescribed by § 173.302a(b) (2), (3) and (4) of this subchapter.

(3) Except as specified in paragraph (b)(2) of this section, if a cylinder, marked with a star, is filled with a compressed gas other than as specified in paragraph (b)(1)(ii) of this section, the star following the most recent test date must be obliterated. The cylinder must be requalified five years from the marked test date, or prior to the first filling with a compressed gas, if the required five-year requalification period has passed.

(c) *DOT 4-series cylinders.* A DOT 4-series cylinder, except a 4L cylinder, that at any time shows evidence of a leak or of internal or external corrosion, denting, bulging or rough usage to the extent that it is likely to be weakened appreciably, or that has lost five percent or more of its official tare weight must be requalified before being re-

filled and offered for transportation. (Refer to CGA Pamphlet C-6 or C-6.3, as applicable, regarding cylinder weakening.) After testing, the actual tare weight must be recorded as the new tare weight.

(d) *Cylinders 5.44 kg (12 lb) or less with service pressures of 300 psig or less.* A cylinder of 5.44 (12 lb) or less water capacity authorized for service pressure of 300 psig or less must be given a complete external visual inspection at the time periodic requalification becomes due. External visual inspection must be in accordance with CGA Pamphlet C-6 or C-6.1 (incorporated by reference; see § 171.7 of this subchapter). The cylinder may be proof pressure tested. The test is successful if the cylinder, when examined under test pressure, does not display a defect described in § 180.205(i)(1) (ii) or (iii). Upon successful completion of the test and inspection, the cylinder must be marked in accordance with § 180.213.

(e) *Proof pressure test* A cylinder made in conformance with specifications DOT 4B, 4BA, 4BW, or 4E used exclusively for: liquefied petroleum gas that meets the detail requirement limits in Table I of ASTM D 1835, "Standard Specification for Liquefied Petroleum (LP) Gases" (incorporated by reference; see § 171.7 of this subchapter) or an equivalent standard containing the same limits; anhydrous dimethylamine; anhydrous methylamine; anhydrous trimethylamine; methyl chloride; methylacetylene-propadiene stabilized; or dichlorodifluoromethane, difluoroethane, difluorochloroethane, chlorodifluoromethane, chlorotetrafluoroethane, trifluorochloroethylene, or mixture thereof, or mixtures of one or more with trichlorofluoromethane; and commercially free from corroding components and protected externally by a suitable corrosion-resistant coating (such as galvanizing or painting) may be requalified by volumetric expansion testing every 12 years instead of every five years. As an alternative, the cylinder may be subjected to a proof pressure test at least two times the marked service pressure, but this latter type of test must be repeated every seven years after expiration of the first 12-year period. When subjected to a proof

pressure test, the cylinder must be carefully examined under test pressure and removed from service if a leak or defect is found.

(f) *Poisonous materials.* A cylinder conforming to specification DOT 3A, 3AA, 3B, 4BA, or 4BW having a service pressure of 300 psig or less and used exclusively for methyl bromide, liquid; mixtures of methyl bromide and ethylene dibromide, liquid; mixtures of methyl bromide and chlorpicrin, liquid; mixtures of methyl bromide and petroleum solvents, liquid; or methyl bromide and nonflammable, nonliquefied compressed gas mixtures, liquid; commercially free of corroding components, and protected externally by a suitable corrosion resistant coating (such as galvanizing or painting) and internally by a suitable corrosion resistant lining (such as galvanizing) may be tested every 10 years instead of every five years, provided a visual internal and external examination of the cylinder is conducted every five years in accordance with CGA Pamphlet C-6 (incorporated by reference; see §171.7 of this subchapter). The cylinder must be examined at each filling, and rejected if a dent, corroded area, leak or other condition indicates possible weakness.

(g) *Visual inspections.* A cylinder conforming to a specification listed in the table in this paragraph and used exclusively in the service indicated may, in-

stead of a periodic hydrostatic test, be given a complete external visual inspection at the time periodic requalification becomes due. External visual inspection must be in accordance with CGA Pamphlet C-6 or C-6.3, as applicable (incorporated by reference; see §171.7 of this subchapter). When this inspection is used instead of hydrostatic pressure testing, subsequent inspections are required at five-year intervals after the first inspection. After May 31, 2004, inspections must be made only by persons holding a current RIN and the results recorded and maintained in accordance with §180.215. Records must include: date of inspection (month and year); DOT specification number; cylinder identification (registered symbol and serial number, date of manufacture, and owner); type of cylinder protective coating (including statement as to need of refinishing or recoating); conditions checked (e.g., leakage, corrosion, gouges, dents or digs in shell or heads, broken or damaged footing or protective ring or fire damage); disposition of cylinder (returned to service, returned to cylinder manufacturer for repairs or condemned). A cylinder passing requalification by the external visual inspection must be marked in accordance with §180.213. Specification cylinders must be in exclusive service as shown in the following table:

Cylinders conforming to—	Used exclusively for—
DOT 3A, DOT 3AA, DOT 3A480X, DOT 4AA480	Anhydrous ammonia of at least 99.95% purity.
DOT 3A, DOT 3AA, DOT 3A480X, DOT 3B, DOT 4B, DOT 4BA, DOT 4BW.	Butadiene, inhibited, that is commercially free from corroding components.
DOT 3A, DOT 3A480X, DOT 3AA, DOT 3B, DOT 4AA480, DOT 4B, DOT 4BA, DOT 4BW.	Cyclopropane that is commercially free from corroding components.
DOT 3A, DOT 3AA, DOT 3A480X, DOT 4B, DOT 4BA, DOT 4BW, DOT 4E.	Chlorinated hydrocarbons and mixtures thereof that are commercially free from corroding components.
DOT 3A, DOT 3AA, DOT 3A480X, DOT 4B, DOT 4BA, DOT 4BW, DOT 4E.	Fluorinated hydrocarbons and mixtures thereof that are commercially free from corroding components.
DOT 3A, DOT 3AA, DOT 3A480X, DOT 3B, DOT 4B, DOT 4BA, DOT 4BW, DOT 4E.	Liquefied hydrocarbon gas that is commercially free from corroding components.
DOT 3A, DOT 3AA, DOT 3A480X, DOT 3B, DOT 4B, DOT 4BA, DOT 4BW, DOT 4E.	Liquefied petroleum gas that meets the detail requirements limits in Table 1 of ASTM 1835, Standard Specification for Liquefied Petroleum (LP) Gases (incorporated by reference; see §171.7 of this subchapter) or an equivalent standard containing the same limits.
DOT 3A, DOT 3AA, DOT 3B, DOT 4B, DOT 4BA, DOT 4BW, DOT 4E.	Methylacetylene-propadiene, stabilized, that is commercially free from corroding components.
DOT 3A, DOT 3AA, DOT 3B, DOT 4B, DOT 4BA, DOT 4BW ..	Anhydrous mono, di, trimethylamines that are commercially free from corroding components.
DOT 4B240, DOT 4BW240	Ethyleneimine, stabilized.

(h) *Cylinders containing anhydrous ammonia.* A cylinder conforming to speci-

fication DOT 3A, 3A480X, or 4AA480

used exclusively for anhydrous ammonia, commercially free from corroding components, and protected externally by a suitable corrosion-resistant coating (such as paint) may be requalified every 10 years instead of every five years.

(i) *Requalification of DOT-8 series cylinders.* (1) Each owner of a DOT-8 series

cylinder used to transport acetylene must have the cylinder shell and the porous filler requalified in accordance with CGA Pamphlet C-13 (incorporated by reference; see §171.7 of this subchapter). Requalification must be performed in accordance with the following schedule:

Date of cylinder manufacture	Shell (visual inspection) requalification		Porous filler requalification	
	Initial	Subsequent	Initial	Subsequent
Before January 1, 1991	Before January 1, 2001	10 years	Before January 1, 2011	Not required.
On or after January 1, 1991.	10 years ¹	10 years	3 to 20 years ²	Not required.

¹ Years from date of cylinder manufacture.
² For a cylinder manufactured on or after January 1, 1991, requalification of the porous filler must be performed no sooner than 5 years, and no later than 20 years, from the date of manufacture.

(2) Unless requalified and marked in accordance with CGA Pamphlet C-13 (incorporated by reference; see §171.7 of this subchapter) before October 1, 1994, an acetylene cylinder must be requalified by a person who holds a current RIN.

(3) If a cylinder valve is replaced, a cylinder valve of the same weight must be used or the tare weight of the cylinder must be adjusted to compensate for valve weight differential.

(4) The person performing a visual inspection or requalification must record the results as specified in §180.215.

(5) The person performing a visual inspection or requalification must mark the cylinder as specified in §180.213.

(j) *Cylinder used as a fire extinguisher.* Only a DOT specification cylinder used as a fire extinguisher and meeting Special Provision 18 in §172.102(c)(1) of this subchapter may be requalified in accordance with this paragraph (j).

(1) A DOT 4B, 4BA, 4B240ET or 4BW cylinder may be tested as follows:

(i) For a cylinder with a water capacity of 5.44 kg (12 lb) or less, by volumetric expansion test using the water jacket method or by proof pressure test. A requalification must be performed by the end of 12 years after the original test date and at 12-year intervals thereafter.

(ii) For a cylinder having a water capacity over 5.44 kg (12 lb)—

(A) *By proof pressure test.* A requalification must be performed by the end of 12 years after the original test date and at 7-year intervals; or

(B) *By volumetric expansion test using the water jacket method.* A requalification must be performed 12 years after the original test date and at 12-year intervals thereafter.

(2) A DOT 3A, 3AA, or 3AL cylinder must be requalified by volumetric expansion test using the water jacket method. A requalification must be performed 12 years after the original test date and at 12-year intervals thereafter.

(k) *3HT cylinders.* In addition to the other requirements of this section, a cylinder marked DOT-3HT must be requalified in accordance with CGA Pamphlet C-8.

(l) *Requalification of foreign cylinders filled for export.* A cylinder manufactured outside the United States, other than as provided in §171.12a of this subchapter, that has not been manufactured, inspected, tested and marked in accordance with part 178 of this subchapter may be filled with compressed gas in the United States, and shipped solely for export if it meets the following requirements, in addition to other requirements of this subchapter:

(1) It has been inspected, tested and marked (with only the month and year of test) in conformance with the procedures and requirements of this subpart or the Associate Administrator has authorized the filling company to fill foreign cylinders under an alternative method of qualification; and

(2) It is offered for transportation in conformance with the requirements of § 173.301(l) of this subchapter.

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§ 180.211 Repair, rebuilding and reheat treatment of DOT-4 series specification cylinders.

(a) *General requirements for repair and rebuilding.* Any repair or rebuilding of a DOT 4-series cylinder must be performed by a person holding an approval as specified in § 107.805 of this chapter. A person performing a rebuild function is considered a manufacturer subject to the requirements of § 178.2(a)(2) and subpart C of part 178 of this subchapter. The person performing a repair, rebuild, or reheat treatment must record the test results as specified in § 180.215. Each cylinder that is successfully repaired or rebuilt must be marked in accordance with § 180.213.

(b) *General repair requirements.* Each repair of a DOT 4-series cylinder must be made in accordance with the following conditions:

(1) The repair and the inspection of the work performed must be made in accordance with the requirements of the cylinder specification.

(2) The person performing the repair must use the procedure, equipment, and filler metal or brazing material as authorized by the approval issued under § 107.805 of this chapter.

(3) Welding and brazing must be performed on an area free from contaminants.

(4) A weld defect, such as porosity in a pressure retaining seam, must be completely removed before re-welding. Puddling may be used to remove a weld defect only by the tungsten inert gas shielded arc process.

(5) After removal of a non-pressure attachment and before its replacement, the cylinder must be given a visual inspection in accordance with § 180.205(f).

(6) Reheat treatment of DOT 4B, 4BA or 4BW specification cylinders after replacement of non-pressure attachments is not required when the total weld material does not exceed 20.3 cm (8 inches). Individual welds must be at least 7.6 cm (3 inches) apart.

(7) After repair of a DOT 4B, 4BA or 4BW cylinder, the weld area must be leak tested at the service pressure of the cylinder.

(8) Repair of weld defects must be free of cracks.

(9) When a non-pressure attachment with the original cylinder specification markings is replaced, all markings must be transferred to the attachment on the repaired cylinder.

(10) Walls, heads or bottoms of cylinders with defects or leaks in base metal may not be repaired, but may be replaced as provided for in paragraph (d) of this section.

(c) *Additional repair requirements for 4L cylinders.* (1) Repairs to a DOT 4L cylinder must be performed in accordance with paragraphs (a) and (b) of this section and are limited to the following:

(i) The removal of either end of the insulation jacket to permit access to the cylinder, piping system, or neck tube.

(ii) The replacement of the neck tube. At least a 13 mm (0.51 inch) piece of the original neck tube must be protruding above the cylinder's top end. The original weld attaching the neck tube to the cylinder must be sound and the replacement neck tube must be welded to this remaining piece of the original neck tube.

(iii) The replacement of material such as, but not limited to, the insulating material and the piping system within the insulation space is authorized. The replacement material must be equivalent to that used at the time of original manufacture.

(iv) Other welding procedures that are permitted by CGA Pamphlet C-3 (incorporated by reference; see § 171.7 of this subchapter), and not excluded by the definition of "rebuild," are authorized.

(2) After repair, the cylinder must be—

(i) Pressure tested in accordance with the specifications under which the cylinder was originally manufactured;

(ii) Leak tested before and after assembly of the insulation jacket using a mass spectrometer detection system; and

(iii) Tested for heat conductivity requirements.